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APPLE, PEACH AND GRAPE: ESTIMATED ESTABLISHMENT COSTS, ONTARIO, 1991

POLICY ANALYSIS BRANCH

ONTARIO MINISTRY OF AGRICULTURE AND FOOD
LEGISLATIVE BUILDINGS, TORONTO, ONTARIO M7A 2B2

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ECONOMICS INFORMATION

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APPLE, PEACH AND GRAPE

ESTIMATED ESTABLISHMENT COSTS

ONTARIO, 1991

by

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INTRODUCTION

Since 1948, the Policy Analysis Branch has carried out comprehensive studies of major field and horticultural crops grown in Ontario. These studies were designed to determine costs and returns of various farm enterprises, as well as the physical amounts of production inputs required.

Traditionally, data was collected by means of farmer interviews. Published reports of these studies in the form of county, regional and provincial averages found a wide distribution among extension and research personnel, educational institutions, farm organizations, lending institutions and policy makers. Cooperating farmers received reports showing their individual information in comparison with group averages.

With this extensive background in the development of cost studies, the Policy Analysis Branch now use micro-computers in the preparation of cost data. Computer simulation now replaces the time consuming process of data collection, tabulation and analysis.

With this new approach, special attention is paid to the physical quantities and prices of inputs for each crop studied. The technology used in the production of various crops is carefully examined so that the computer models will accurately reflect the appropriate production technology for each commodity.

Information on inputs is obtained from a number of sources, including:

1. previous studies done by this Branch;
2. surveys of the farm supply trade;
3. technical input/output coefficients; and
4. the consensus of producers, researchers, extension and agribusiness personnel.

A wide variation in cost structures exist in any agricultural enterprise. The budgets presented in this study do not reflect the variation that would be found between farms. The budgets are representative of costs likely to be found within the industry and are intended to be used as a guideline of possible costs. The costs represented are not necessarily averages as not enough information is available on the actual cost structures that various farms operate under. Individuals with information about their own costs are able to make adjustments using the published budgets as a starting point.

THE DEVELOPMENT OF THE BUDGETING PROGRAM

A large number of computer programs that generate budgets and crop production cost estimates are now in existence. These computer programs vary in their degree of sophistication and in the amount of detail prepared. A large number of estimates covering a wide range of conditions can be generated quickly and efficiently. The effect of varying levels of technology, management practices and price levels can also be analyzed.

The 1991 cost of production estimates shown in this report are generated by a program originally written in Mississippi, adapted by the University of Minnesota, and modified by the Policy Analysis Branch to accommodate Ontario agricultural conditions.

Users of the budgets should be aware that a new method of calculation was used in 1991 and as a result direct comparisons to prior years may be difficult.

METHODS AND PROCEDURES

The information used in the preparation of each production cost estimate was prepared through the use of recent Policy Analysis Branch studies, plus consultation with producers, extension, research and agribusiness personnel.

For each crop cost estimate in this report, the data was organized into variable and measurable fixed costs and totalled to arrive at the cost of production on a per acre basis. Variable costs are those which vary directly with the production of each crop grown. They include seed, plants, hired labour, fertilizer, herbicides, insecticides, fungicides, other materials, machinery operating costs, marketing charges and interest on operating capital. Fixed cost inputs are interest and depreciation on machinery, and other overhead cost items. Some fixed costs vary considerably or are difficult to measure thus the user should be fully aware that there may be other costs to consider. Owner labour, land charges and returns to management are discussed below.

LABOUR HOURS AND COSTS

Labour hours required for each crop were based on previous studies, as well as discussions with those familiar with the production of each crop.

The budget generator separates labour into two categories. First, any labour utilized for operating farm machinery is classified as machine operator labour. These labour hours are valued at $8.25 per hour and include benefits such as worker compensation, unemployment and health insurance and Canada Pension Plan. Secondly, labour utilized for any task other than machinery operation is classified as hired labour and is valued at $7.25 per hour including benefits.

The labour hours of the farm owner are included in the total labour hours recorded for each crop. However, since owner's contribution to the total hours of labour per acre will vary substantially between farm enterprises, a random estimate of the owner's share of total labour hours is not given.

A management allowance is not included as a cost. In previous cost of production publications a management allowance was calculated as 5% of gross income. Profits will vary substantially between crops and farm enterprises. The return to management is realized in the profit received when producing any crop and a user may allocate a management fee if it is appropriate to his/her situation.

LAND CHARGES

Determining the annual cost for land use is a controversial part of any study on production costs. Land prices and rental rates vary considerably between crops, regions and individuals. For this reason space is provided for the user to insert land rental cost in the variable costs section or land ownership cost in the fixed cost section.

MATERIALS

The amount of each material input was based on commonly used practices. Input prices are based on averages charged by the trade in the area where the particular crop is grown. For most crops, the quantities of seed, plants, fertilizer nutrients and other inputs are given on a per acre basis. Because of the multitude of products available, pesticides are grouped as herbicides, insecticides, fungicides, nematicides, etcetera. The cost and quantity of non-returnable containers is reported where applicable.

TRACTORS, MACHINES AND TRUCKS

Machinery complements used in the various crop production cost estimates were assumed to be five years old. Tractor and machine costs included depreciation, interest on investment, repairs and fuel. If machines were used for other farming operations, costs were adjusted based on the proportion of use on the study crop. The declining balance method of depreciation was used, based on estimates of useful life, annual use and salvage value.

Interest on machinery investment was calculated on the assumption that the equity portion was 70 percent and the debt portion was 30 percent of the total depreciated value. For this report, interest on equity was calculated at 4.75 percent, which was the average interest rate paid by chartered banks on savings accounts. The interest on the debt portion was based on the average prime rate of 10.0 percent, plus one for a total of 11.0 percent. Insurance and storage costs for machinery are included in other overhead.

Fuel costs were based on the size of each tractor, truck or self-propelled machine used in the production operation. The following farmgate fuel prices were used: gasoline - 37 cents/litre; diesel - 33 cents/litre. Fuel costs are net of all 1991 Provincial and Federal rebates.

CUSTOM FARMWORK SERVICES

There are crops produced in Ontario where it is an accepted practice to use custom farmwork services to perform certain operations. Usually, these services are employed when the farmer needs specialized machines, such as harvesters, sprayers, fertilizer applicators and trucks. Custom costs were itemized on a per acre basis, and obtained from discussions with growers and those providing the service.

INTEREST ON OPERATING CAPITAL

Interest on operating capital required to finance each crop was calculated from the time an expenditure was made until the end of the fourth year of establishment. Operating capital includes the cost of materials, fuel, repairs, hired labour, and other cash items. In this study, the interest rate applied to operating capital was the average estimated prime rate for 1991 of 10.0 percent plus 1 percent for a rate of 11.0 percent.

OTHER OVERHEAD

This allowance covers such items as the study crop's share of utilities, equipment storage and insurance, accounting and administration costs, use of the farm automobile, and general farm maintenance.

YOUR INPUT

The accuracy and representativeness of the cost of production budgets can only be kept up-to-date through continuous contact with individuals involved in production, marketing, processing or research for each crop. If you have any questions or can contribute to any of the budgets in this report please feel free to call the author at (416) 562-4141.

APPLE ORCHARD ESTABLISHMENT

The apple orchard under consideration is planted on semi-dwarf rootstock at a medium density of 300 trees per acre. The establishment of this orchard covers a 4 1/2 year period: a half year for soil preparation, one year for planting, and three years for the trees to grow to bearing age.

Table 1.--Apples on Size-Controlling Trees, "Preplant Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Machine operator, 4.1 hrs	_____	33
Fertilizer, 15-15-15, 100 kg	_____	26
Cover crop seed	_____	4
Fumigant	_____	193
Tractor and machine costs:		
Repairs and maintenance	_____	10
Fuel	_____	12
Custom fumigation	_____	30
Interest on operating capital	_____	127
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**435**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	9
Interest on investment	_____	13
Other overhead	_____	38
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**60**
TOTAL MEASURABLE "PREPLANT YEAR" COSTS	_____	**495**

Table 2.-- Apples on Size-Controlling Trees, "Preplant Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Discing	1.3	10.89	7.34	6.20	24.43
Cultivating	0.6	4.79	3.68	3.44	11.91
Sow cover crop	0.7	5.45	2.50	2.62	10.57
Plowing	0.8	6.21	4.48	5.02	15.71
Soil packing	0.7	5.45	3.81	4.11	13.37

* Fixed costs include depreciation and interest on investment.

Table 3.--Apples on Size-Controlling Trees, "Planting Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 46.0 hrs	_____	334
Machine operator, 28.0 hrs	_____	231
Fertilizer, 15-15-15, 100 kg	_____	26
Insecticides	_____	56
Fungicides	_____	79
Herbicides	_____	38
Trees, 300 semi-dwarf	_____	1,530
Tree guards, 300	_____	168
Mouse bait, 1.8 kg	_____	4
Tractor and machine costs:		
Repairs and maintenance	_____	59
Fuel	_____	70
Equipment rental	_____	50
Interest on operating capital	_____	1,047
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**3,692**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	67
Interest on investment	_____	45
Other overhead	_____	75
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**187**
TOTAL MEASURABLE "PLANTING YEAR" COSTS	_____	**3,879**

Table 4.--Apples on Size-Controlling Trees, "Planting Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Discing	1.3	10.89	7.34	6.19	24.42
Design and layout	8.2	61.65	8.85	9.01	79.51
Digging holes	12.0	99.00	110.91	40.04	249.95
Planting	25.0	184.92	14.11	13.31	212.34
Watering	4.6	36.28	9.70	13.02	59.00
Fertilizing	2.3	18.14	4.70	4.44	27.28
Weed spraying (2x)	1.3	10.89	4.85	6.52	22.26
Discing (3x)	2.0	16.34	11.01	9.30	36.65
Spray pesticide (3x)	1.3	10.78	7.66	9.62	28.06
Summer management	5.0	36.75	--	--	36.75
Installing tree guards	10.0	72.50	--	--	72.50
Apply mouse bait	1.0	7.25	--	--	7.25

* Fixed costs include depreciation and interest on investment.

Table 5.--Apples on Size-Controlling Trees, "Second Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 20.0 hrs	_____	145
Machine operator, 10.0 hrs	_____	83
Fertilizer:		
15-15-15, 100 kg	_____	26
Ammonium nitrate, 50 kg	_____	13
Insecticides	_____	131
Fungicides	_____	114
Herbicides	_____	49
Trees, 15 replacements	_____	76
Cover crop seed	_____	33
Mouse bait, 1.8 kg	_____	4
Tractor and machine costs:		
Repairs and maintenance	_____	22
Fuel	_____	23
Interest on operating capital	_____	218
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**937**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	29
Interest on investment	_____	19
Other overhead	_____	75
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**123**
TOTAL MEASURABLE "SECOND YEAR" COSTS	_____	**1,060**

Table 6.--Apples on Size-Controlling Trees, "Second Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Replant trees	4.3	32.64	4.70	4.44	41.78
Prune & train	8.0	58.00	--	--	58.00
Fertilizing (2x)	3.0	23.59	7.20	7.06	37.85
Weed spraying (2x)	1.3	10.89	4.85	6.51	22.25
Discing (2x)	1.3	10.89	7.34	6.20	24.43
Spray pesticide (5x)	2.2	17.97	12.78	16.04	46.79
Summer management	7.0	50.75	--	--	50.75
Harrow (2x)	0.6	50.75	2.99	2.15	9.93
Sow cover crop	0.7	5.45	2.50	2.63	10.58
Apply mouse bait	1.0	7.25	--	--	7.25
Spot weed control	0.7	5.45	2.42	3.25	11.12

* Fixed costs include depreciation and interest on investment

Table 7.--Apples on Size-Controlling Trees, "Third Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 39.0 hrs	_____	283
Machine operator, 8.1 hrs	_____	67
Fertilizer:		
15-15-15, 160 kg	_____	41
Ammonium nitrate, 50 kg	_____	13
Insecticides	_____	131
Fungicides	_____	114
Herbicides	_____	24
Trees, 3 replacements	_____	15
Mouse bait, 1.8 kg	_____	4
Tractor and machine costs:		
Repairs and maintenance	_____	23
Fuel	_____	20
Interest on operating capital	_____	133
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**868**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	26
Interest on investment	_____	18
Other overhead	_____	75
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**119**
TOTAL MEASURABLE "THIRD YEAR" COSTS	_____	**987**

Table 8.--Apples on Size-Controlling Trees, "Third Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Replanting trees	1.3	10.89	4.70	4.44	20.03
Prune & train	25.0	181.25	--	--	181.25
Fertilizing (2x)	3.0	23.59	7.20	7.06	37.85
Weed spraying	0.7	5.45	2.42	3.25	11.12
Mowing (3x)	2.0	16.34	16.09	13.20	45.63
Spray pesticide (5x)	2.2	17.97	12.78	16.04	46.79
Summer management	9.0	65.25	--	--	65.25
Apply mouse bait	1.0	7.25	--	--	7.25
Tree guard adjusting	3.0	21.75	--	--	21.75

* Fixed costs include depreciation and interest on investment

Table 9.--Apples on Size-Controlling Trees, "Fourth Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 27.0 hrs	_____	196
Machine operator, 9.0 hrs	_____	74
Fertilizer:		
Muriate of potash, 80 kg	_____	17
Ammonium nitrate, 35 kg	_____	9
Insecticides	_____	146
Fungicides	_____	131
Herbicides	_____	24
Trees, 3 replacements	_____	15
Mouse bait, 1.8 kg	_____	4
Tractor and machine costs:		
Repairs and maintenance	_____	28
Fuel	_____	24
Interest on operating capital	_____	41
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**709**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	32
Interest on investment	_____	21
Other overhead	_____	75
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**128**
TOTAL MEASURABLE "FOURTH YEAR" COSTS	_____	**837**

Table 10.--Apples on Size-Controlling Trees, "Fourth Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Replanting trees	1.3	10.89	4.70	4.44	20.03
Prune & train	20.0	145.00	--	--	145.00
Fertilizing (2x)	1.3	10.89	5.01	5.24	21.14
Weed spraying	0.7	5.45	2.42	3.25	11.12
Mowing (4x)	2.6	21.78	21.46	17.60	60.84
Spray pesticide (7x)	3.1	25.16	17.89	22.44	65.49
Summer management	6.0	43.50	--	--	43.50
Applying mouse bait	1.0	7.25	--	--	7.25

* Fixed costs include depreciation and interest on investment

Table 11.--Apples on Size-Controlling Trees, Total Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
Preplanting Year	_____	495
Planting Year	_____	3,879
Second Year	_____	1,060
Third Year	_____	987
Fourth Year	_____	837
TOTAL	_____	7,258

CONCLUSIONS

The total cost, not including land charges, of establishing this size-controlling apple orchard, estimated at $7,258 per acre, should be charged over the productive life of the orchard. If the productive life of the orchard is estimated at 20 years, the establishment cost should be amortized over the 20-year period.

Since no allowance is made for inflation over the productive cycle, an amortization rate of 9.3 percent, which is the lending rate for 1990 adjusted for inflation, is used. Amortizing the $7,258 establishment cost using a 9.3 percent rate gives an annual cost of $812 per acre for each year of the production period.

PEACH ORCHARD ESTABLISHMENT

The peach orchard under consideration is planted at 145 trees per acre. The establishment of this orchard covers a 4 1/2 year period: a half year for soil preparation, one year for planting, and three years for the trees to grow to bearing age.

Table 12.--Peach "Preplant Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Machine operator, 4.1 hrs	_____	33
Fumigant	_____	193
Tractor and machine costs:		
Repairs and maintenance	_____	10
Fuel	_____	13
Custom fumigation	_____	30
Interest on operating capital	_____	136
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**415**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	13
Interest on investment	_____	8
Other overhead	_____	50
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**71**
TOTAL MEASURABLE "PREPLANT YEAR" COSTS	_____	**486**

Table 13.--Peach "Preplant Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Plowing	0.8	6.21	4.48	5.02	15.71
Discing	1.3	10.89	7.34	6.19	24.42
Rotovating	1.3	10.89	7.32	6.14	24.35
Soil packing	0.7	5.45	3.81	4.11	13.37

* Fixed costs include depreciation and interest on investment

Table 14.--Peach "Planting Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 29.0 hrs	_____	210
Machine operator, 16.2 hrs	_____	133
Fertilizer, 15-15-15, 40 kg	_____	10
Insecticides	_____	36
Cover crop seed	_____	4
Trees, 145	_____	616
Tree guards, 145	_____	81
Tractor and machine costs:		
Repairs and maintenance	_____	45
Fuel	_____	45
Equipment rental	_____	25
Interest on operating capital	_____	503
Land rental	_____	
TOTAL VARIABLE COSTS	_____	1,708
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	45
Interest on investment	_____	30
Other overhead	_____	100
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	175
TOTAL MEASURABLE "PLANTING YEAR" COSTS	_____	1,883

Table 15.--Peach "Planting Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Discing	1.3	10.89	7.34	6.19	24.42
Levelling	1.3	10.89	6.90	5.21	23.00
Pick up trees	2.2	18.15	8.85	9.01	36.01
Planting trees	16.8	126.60	24.36	16.02	166.98
Discing (2x)	1.3	10.89	7.34	6.19	24.42
Harrowing (2x)	0.6	4.79	2.99	2.15	9.93
Hand weeding	3.0	21.75	--	--	21.75
Pruning	7.0	50.75	--	--	50.75
Spray pesticides (3x)	1.3	10.78	7.66	9.62	28.06
Sow cover crop	0.7	5.45	2.50	2.61	10.56
Install tree guards	5.0	36.25	--	--	36.25
Mowing (4x)	2.6	21.78	21.46	17.60	60.84
General maintenance	2.0	14.50	--	--	14.50

* Fixed costs include depreciation and interest on investment

Table 16.--Peach "Second Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 9.0 hrs	_____	65
Machine operator, 10.3 hrs	_____	85
Fertilizer, 15-15-15, 40 kg	_____	10
Insecticides	_____	33
Fungicides	_____	17
Herbicides	_____	19
Cover crop seed	_____	4
Trees, 10 replacements	_____	42
Tractor and machine costs:		
Repairs and maintenance	_____	28
Fuel	_____	27
Interest on operating capital	_____	119
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**449**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	32
Interest on investment	_____	21
Other overhead	_____	100
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**153**
TOTAL MEASURABLE "SECOND YEAR" COSTS	_____	**602**

Table 17.--Peach "Second Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Replanting trees	2.6	21.78	9.40	8.88	40.06
Pruning	7.0	50.75	--	--	50.75
Discing (4x)	2.6	21.78	14.68	12.39	48.85
Sow cover crop	0.7	5.45	2.50	2.61	10.51
Weed spraying	0.7	5.45	2.42	3.25	11.12
Spray pesticide (4x)	1.7	14.37	10.21	12.82	37.42
Mowing (3x)	2.0	16.34	16.09	13.20	45.63
General maintenance	2.0	14.50	--	--	14.50

* Fixed costs include depreciation and interest on investment

Table 18.--Peach "Third Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 16.0 hrs	_____	116
Machine operator, 10.7 hrs	_____	89
Fertilizer, 15-15-15, 40 kg	_____	10
Insecticides	_____	114
Fungicides	_____	60
Herbicides	_____	19
Cover crop seed	_____	4
Trees, 5 replacements	_____	21
Tractor and machine costs:		
Repairs and maintenance	_____	31
Fuel	_____	30
Interest on operating capital	_____	98
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**592**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	37
Interest on investment	_____	25
Other overhead	_____	100
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**162**
TOTAL MEASURABLE "THIRD YEAR" COSTS	_____	**754**

Table 19.--Peach "Third Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Replanting trees	1.3	10.89	4.70	4.44	20.03
Pruning	14.0	101.50	--	--	101.50
Discing (4x)	2.6	21.78	14.68	12.39	48.85
Sowing cover crop	0.7	5.45	2.50	2.61	10.51
Weed spraying	0.7	5.45	2.42	3.25	11.12
Spray pesticide (8x)	3.5	28.75	20.44	25.65	74.84
Mowing (3x)	2.0	16.34	16.09	13.20	45.63
General Maintenance	2.0	14.50	--	--	14.50

* Fixed costs include depreciation and interest on investment

Table 20.--Peach "Fourth Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 36.0 hrs	_____	261
Machine operator, 9.4 hrs	_____	78
Fertilizer, 15-15-15, 40 kg	_____	10
Insecticides	_____	138
Fungicides	_____	140
Herbicides	_____	19
Cover crop seed	_____	4
Paint and repellant	_____	30
Tractor and machine costs:		
Repairs and maintenance	_____	28
Fuel	_____	28
Interest on operating capital	_____	46
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**782**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	34
Interest on investment	_____	23
Other overhead	_____	100
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**157**
TOTAL MEASURABLE "FOURTH YEAR" COSTS	_____	**939**

Table 21.--Peach "Fourth Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Pruning	24.0	174.00	--	--	174.00
Discing (4x)	2.6	21.78	14.68	12.39	48.85
Sow cover crop	0.7	5.45	2.50	2.61	10.51
Weed spraying	0.7	5.45	2.42	3.25	11.12
Spray pesticide (8x)	3.5	28.75	20.44	25.65	74.84
Mowing (3x)	2.0	16.34	16.09	13.20	45.63
Painting trees	10.0	72.50	--	--	72.50
General maintenance	2.0	14.50	--	--	14.50

* Fixed costs include depreciation and interest on investment

Table 22.--Peach Total Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
Preplanting Year	_____	486
Planting Year	_____	1,883
Second Year	_____	602
Third Year	_____	754
Fourth Year	_____	939
TOTAL	_____	4,664

CONCLUSIONS

The total cost, not including land charges, of establishing this new peach orchard, estimated at $4,664 per acre, should be charged over the productive life of the orchard. If the productive life of the orchard is estimated at 15 years, the establishment cost should be amortized over the 15-year period.

Since no allowance is made for inflation over the production cycle, an amortization rate of 9.3 percent, which is the lending rate for 1990 adjusted for inflation, is used. Amortizing the $4,664 establishment cost using a 9.3 percent rate, gives an annual cost of $589 per acre for each year of the production period.

GRAPE VINEYARD ESTABLISHMENT

The vineyard under consideration is planted 600 vines per acre. The establishment of this vineyard covers a 4 1/2 year period: a half year for soil preparation, one year for planting, and three years for the vines to grow to bearing age.

Table 23.--Grape "Preplant Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Machinery operator, 4.1 hrs	_____	33
Tractor and machine costs:		
Repairs and maintenance	_____	10
Fuel	_____	13
Interest on operating capital	_____	36
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**92**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	13
Interest on investment	_____	9
Other overhead	_____	30
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**52**
TOTAL MEASURABLE "PREPLANT YEAR" COSTS	_____	**144**

Table 24.--Grape "Preplant Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Plowing	0.8	6.21	4.48	5.02	15.71
Discing (2x)	1.3	10.89	7.34	6.19	24.42
Rotovating	1.3	10.89	7.32	6.14	24.35
Soil packing	0.7	5.45	3.81	4.11	13.37

* Fixed costs include depreciation and interest on investment

Table 25.--Grape "Planting Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 35.0 hrs	_____	254
Machine operator, 33.2 hrs	_____	274
Fertilizer, 15-15-15, 40 kg	_____	10
Fungicides	_____	24
Grape vines, 600	_____	1,350
Trellis materials	_____	1,275
Cover crop seed	_____	4
Tractor and machine costs:		
Repairs and maintenance	_____	73
Fuel	_____	64
Equipment rental	_____	100
Interest on operating capital	_____	1,343
Land rental	_____	
TOTAL VARIABLE COSTS	_____	4,771
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	89
Interest on investment	_____	59
Other overhead	_____	
Land ownership	_____	60
MEASURABLE FIXED COSTS	_____	208
TOTAL MEASURABLE "PLANTING YEAR" COSTS	_____	4,979

Table 26.--Grape "Planting Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Discing	1.3	10.89	7.34	6.19	24.42
Levelling	1.3	10.89	6.90	5.21	23.00
Picking up vines & supplies	2.2	18.15	8.85	9.01	36.01
Planting	10.3	79.81	18.49	26.24	124.54
Trellis erection	35.0	268.42	55.34	53.51	377.27
Spray pesticide (2x)	0.9	7.19	5.11	6.42	18.72
Weed control	2.6	21.78	9.80	20.01	51.59
Discing (2x)	1.3	10.89	7.34	6.19	24.42
Rotovating (2x)	2.6	21.78	14.65	12.28	48.71
Summer pruning & tying	10.0	72.50	--	--	72.50
Sow cover crop	0.7	5.45	2.50	2.61	25.06

* Fixed costs include depreciation and interest on investment

Table 27.--Grape "Second Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 32.0 hrs	_____	218
Machine operator, 11.9 hrs	_____	98
Fertilizer:		
Ammonium nitrate, 45 kg	_____	12
15-15-15, 40 kg	_____	10
Insecticides	_____	16
Fungicides	_____	37
Replacement vines, 30	_____	68
Trellis materials	_____	155
Cover crop seed	_____	4
Tractor and machine costs:		
Repairs and maintenance	_____	26
Fuel	_____	28
Interest on operating capital	_____	201
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**873**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	37
Interest on investment	_____	25
Other overhead	_____	60
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**122**
TOTAL MEASURABLE "SECOND YEAR" COSTS	_____	**995**

Table 28.--Grape "Second Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Replacing vines	4.0	32.67	14.12	13.31	60.10
Pruning	10.0	72.50	--	--	72.50
Tying	6.0	30.00	--	--	30.00
Install second wire	5.3	39.89	4.70	4.44	49.03
Weed control	2.6	21.78	9.80	20.01	51.59
Discing (2x)	1.3	10.89	7.34	6.19	24.42
Rotovating (2x)	2.6	21.78	14.65	12.28	48.71
Spray Pesticide (3x)	1.3	10.78	7.66	9.63	28.07
Fertilizing	0.7	5.45	2.50	2.61	10.51
Summer prune & tying	10.0	72.50	--	--	72.50
Sow cover crop	0.7	5.45	2.50	2.61	10.51

* Fixed costs include depreciation and interest on investment

Table 29.--Grape "Third Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 30.0 hrs	_____	204
Machine operator, 12.6 hrs	_____	104
Fertilizer:		
Muriate of potash, 170 kg	_____	36
15-15-15, 40 kg	_____	10
Insecticides	_____	52
Fungicides	_____	81
Herbicides	_____	19
Manure, 10 tons	_____	100
Replacement vines, 24	_____	54
Cover crop seed	_____	4
Tractor and machine costs:		
Repairs and maintenance	_____	29
Fuel	_____	33
Interest on operating capital	_____	130
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**856**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	41
Interest on investment	_____	28
Other overhead	_____	60
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**129**
TOTAL MEASURABLE "THIRD YEAR" COSTS	_____	**985**

Table 30.--Grape "Third Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Replacing vines	2.6	21.78	9.41	8.87	40.06
Pruning	14.0	101.50	--	--	101.50
Tying	6.0	30.00	--	--	30.00
Fertilizing	0.7	5.45	2.50	2.61	10.56
Manuring	1.5	14.92	10.09	17.19	42.20
Weed spraying	0.7	5.45	2.42	3.25	11.12
Discing (2x)	1.3	10.89	7.34	6.19	24.42
Rotovating (2x)	2.6	21.78	14.65	12.28	48.71
Spray Pesticide (5x)	2.2	17.97	12.78	16.04	46.79
Summer prune & tying	10.0	72.50	--	--	72.50
Sow cover crop	0.7	5.45	2.50	2.61	10.51

* Fixed costs include depreciation and interest on investment

Table 31.--Grape "Fourth Year": Estimated Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
VARIABLE COSTS		
Labour:		
Hired, 36.0 hrs	_____	243
Machine operator, 8.6 hrs	_____	71
Fertilizer:		
Ammonium nitrate, 70 kg	_____	18
15-15-15, 40 kg	_____	10
Insecticides	_____	91
Fungicides	_____	122
Herbicides	_____	19
Cover crop seed	_____	4
Tractor and machine costs:		
Repairs and maintenance	_____	21
Fuel	_____	24
Interest on operating capital	_____	38
Land rental	_____	
TOTAL VARIABLE COSTS	_____	**661**
FIXED COSTS		
Tractor and machine costs:		
Depreciation	_____	28
Interest on investment	_____	18
Other overhead	_____	60
Land ownership	_____	
MEASURABLE FIXED COSTS	_____	**106**
TOTAL MEASURABLE "FOURTH YEAR" COSTS	_____	**767**

Table 32.--Grape "Fourth Year": Operation Costs, Ontario, 1991

Operation	Labour	Labour Costs	Machine Costs		Total Costs
			Maintenance Fuel & Repairs	Fixed* Costs	
	-hours-		-dollars per acre-		
Pruning	18.0	130.50	--	--	130.50
Tying	8.0	40.00	--	--	40.00
Fertilizing	0.7	5.45	2.50	2.61	10.56
Discing (2x)	1.3	10.89	7.34	6.19	24.42
Rotovating (2x)	2.6	21.78	14.65	12.28	48.71
Weed spraying	0.7	5.45	2.42	3.25	11.12
Spray pesticide (6x)	2.6	21.56	15.33	19.24	56.13
Summer prune & tying	10.0	72.50	--	--	72.50
Sow cover crop	0.7	5.45	2.50	2.61	10.56

* Fixed costs include depreciation and interest on investment

Table 33.--Grape Total Cost of Establishment, Ontario, 1991

	Cost per acre	
	Your Farm	Budget
		-dollars-
Preplanting Year	_____	144
Planting Year	_____	4,979
Second Year	_____	995
Third Year	_____	985
Fourth Year	_____	767
TOTAL	_____	**7,870**

CONCLUSIONS

The total cost, not including land charges, of establishing this new vineyard, estimated at $7,870 per acre, should be charged over the productive life of the grapery. If the productive life of the vineyard is estimated at 20 years, the establishment cost should be amortized over the 20-year period.

Since no allowance is made for inflation over the production cycle, an amortization rate of 9.3 percent, which is the lending rate for 1990 adjusted for inflation, is used. Amortizing the $7,870 establishment cost using a 9.3 percent rate gives an annual cost of $881 per acre for each year of the production period.